OIE Training Workshop on Epidemiology, in particular of HPAI and TADs in the Philippines, in collaboration with CIRAD and Bureau of Animal Industry

Sulo hotel, Quezon City, Manila, Philippines, 29 January - 2 February 2007

Mission Report

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RESUME :

Cet atelier a été organisé par l'OIE en collaboration avec le CIRAD et le Bureau of Animal Industry des Philippines. L'objectif visé était de former des agents des bureaux régionaux et nationaux des services vétérinaires à l'épidémiologie des maladies animales, notamment de l'influenza aviaire hautement pathogène et des maladies transfrontalières. La formation reposait sur l'utilisation de deux outils d'apprentissage sur ordinateur : l'un nommé RANEMA, visant à une remise à niveau en épidémiologie des maladies animales et développé par le CIRAD et l'Ecole Nationale Vétérinaire d'Alfort ; l'autre nommé RANEMA FLU, version préliminaire d'un nouveau module de RANEMA développé par le CIRAD et s'intéressant à l'influenza aviaire. L'atelier a rassemblé 25 participants du Bureau of Animal Industry et de ses antennes régionales. Il a permis d'améliorer significativement les connaissances en épidémiologie des participants et de passer en revue différents aspects de la surveillance de l'influenza aviaire hautement pathogène, notamment la définition de cas, l'échantillonnage, et l'analyse de risque. La grande motivation des participants ainsi que leur participation active aux activités du cours ont contribué à la réussite de l'atelier et ont permis de couvrir l'intégralité du programme prévu. Les discussions organisées lors des groupes de travail ont permis de passer en revue et de faire une lecture critique des plans nationaux de surveillance des Philippines pour l'influenza aviaire hautement pathogène et la fièvre aphteuse.

Summary

This workshop was organised by OIE in collaboration with CIRAD and Bureau of Animal Industry of the Philippines. The objective was to train national and regional staff members of the Bureau of Animal Industry in epidemiology of animal health diseases, especially HPAI (highly pathogenic avian influenza) and TADs (transboundary animal diseases). The training used two computer assisted learning tools: one called RANEMA, a refresher course on the epidemiology of animal diseases, which was developed by CIRAD and the ENVA; and one called RANEMA FLU, a preliminary version of a new RANEMA module developed by CIRAD and devoted to avian influenza. The workshop gathered 25 participants from different regional offices and from the central office of the Bureau of Animal Industry. The training successfully enabled to enhance the knowledge of basic epidemiology concepts of the participants and to review different aspects of HPAI surveillance including case definition, sampling design and risk analysis. We could observe an important motivation of the attendees and a very good participation in all activities, contributing to the success of the workshop and to an effective coverage of all lessons scheduled in the programme. Discussions held during working groups enabled to review and criticize HPAI and FMD surveillance plans of the Philippines.

List of acronyms

AEEMA	Association pour l'Etude de l'Epidémiologie des Maladies Animales
ASEAN	Association of Southeast Asian Nations
BAI	Bureau of Animal Industry
CAL	Computer assisted learning
CIRAD	Centre de Coopération Internationale en Recherche Agronomique pour le Développement (French Agricultural Research Centre for International Development)
ENVA	Ecole Nationale Vétérinaire d'Alfort
FAO	Food and Agriculture Organization of the United Nations
FMD	Foot and mouth disease
HPAI	Highly pathogenic avian influenza
MCQ	Multiple choice questionnaire
OIE	Office International des Epizooties (World Organisation for Animal Health)
RANEMA	Remise A Niveau en Epidémiologie des Maladies Animales (Refresher course on the epidemiology of animal diseases)
SEAFMD	Southeast Asia Foot and Mouth Disease Campaign
TADs	Transboundary animal diseases

Table of contents

1. Background 6
2. Objectives of the workshop 6
3. Program and educational approach 7
4. Course of training 7
5. Conclusion and recommendations 9

Annex I: Educational objectives 10
Annex II: Programme 11
Annex III: List of participants 12
Annex IV: Group discussion on HPAI national surveillance program 13
Annex V: Main outputs of the group discussions 14
Annex VI: MCQ 15
Annex VII: Training evaluation 17
Annex VIII: Pictures 20

1. Background

Since 2004, CIRAD has worked in partnership with the Ecole Nationale Vétérinaire d'Alfort (ENVA) to develop a computer assisted learning course (CAL) on basic epidemiology for animal diseases (namely RANEMA). This course is largely based on a veterinary epidemiology handbook (Toma B. et al. Applied Veterinary Epidemiology and the Control of Disease in Population. Maisons-Alfort, AEEMA. 1999), which was adapted to suit the CAL sessions.

Several training workshops on avian influenza surveillance, which used the RANEMA tool to provide basic knowledge on epidemiology, have been organised by the FAO in 2005 and 2006 in Asia, Africa, Eastern Europe and the Middle-East. One of these workshops took place in Bangkok, Thailand, in June 2005 and many of the 18 participants from 10 countries (Cambodia, East Timor, Indonesia, Lao PDR, Malaysia, Myanmar, Papua New Guinea, Philippines, Thailand and Vietnam) asked to use the tutorial to organise training in epidemiology once back in their country.

During the meeting of the OIE SEAFMD Sub-Commission in Chiang Mai, Thailand, in February 2006, the OIE and CIRAD decided to organise a training workshop of trainers for agents of veterinary services involved in animal health epidemiology activities in ASEAN countries. This workshop was held in July 2006 in Bangkok, Thailand, in collaboration with Chulalongkorn University.

Following this CIRAD/OIE workshop in Bangkok, it was decided to organise epidemiology training workshops at the national level, with assistance from national participants trained in Bangkok, in the following countries: Vietnam (November 2006), Philippines (January 2007) and Indonesia (February 2007). The workshops in the Philippines and Indonesia were also the occasion to test the preliminary version of a new module of RANEMA developed by CIRAD and specifically devoted to highly pathogenic avian influenza: RANEMA FLU.

2. Objectives of the workshop

The workshop had the following objectives:

- To review basic epidemiology concepts by using the RANEMA tool
- To present the principles for HPAI surveillance by using newly developed RANEMA-Flu tool
- To review activities in epidemiology developed at the national level with regards to HPAI and FMD.

3. Program and educational approach

At the beginning of the workshop the outputs were defined as follows:

- Enhanced skills and capability in epidemiological analysis on the part of workshop participants (a complete list of RANEMA educational objectives is provided in Annex I)
- Availability of a set of training material (Applied Veterinary Epidemiology handbook and a CD containing the install file for the trainer version of RANEMA)

The training program was drafted by CIRAD and validated by the OIE (see Annex II). It spread over five days, the first of which encompassed several sessions:

- Opening adresses by Dr Davinio Catbagan, Director Bureau of Animal Industry, Dr Ronello Abila, Regional Coordinator - OIE SEAFMD Regional Coordination Unit, Dr Shiro Yoshimura, Senior Deputy Regional Representative Japan/OIE HPAI Special Trust Fund Programme Coordination Office and Dr Stéphanie Desvaux, veterinary epidemiologist at CIRAD.
- A first evaluation of the knowledge in epidemiology of participants by means of a MCQ. This evaluation was to be compared with the one organised at the end of the course with the same MCQ
- Presentations on HPAI and TADs by Dr Shiro Yoshimura.
- Two presentations to introduce the principles of epidemiology and surveillance of animal diseases and the first RANEMA lesson in the computer room

The four following days included an alternation of RANEMA and RANEMA FLU lessons in the computer room, individual and group exercises to further apply concepts seen in RANEMA and RANEMA FLU, question/answer sessions to deepen understanding and review notions that may not have been well explained in the RANEMA and RANEMA FLU lessons, exercises and finally group discussions. The objective was to break the monotony of the course to keep the motivation and attention of the participants.

The RANEMA and RANEMA FLU courses themselves are largely based on participatory techniques as they are designed as a role paying game to teach epidemiological concepts and knowledge on HPAI in a user-friendly way. The trainee plays a veterinarian working for the veterinary services of a virtual country named RANEMA who must refresh his knowledge in epidemiology and HPAI to carry out his professional duties, such as quantifying the situation of a disease, interpreting laboratory results, or designing epidemiologic surveys.

4. Course of training

Participants

This workshop got together 25 participants from different provinces and observers from the Bureau of Animal Industry and OIE Bangkok (See detailed list in Annex III). The strong motivation of all the participants should be stressed as well as their active involvement in all proposed participatory work.

Training organisation

The lectures and the group activities were led by Dr Stéphanie Desvaux and Dr Sophie Molia with the assistance of Mr Rustan Patacsil, previously trained to the use of Ranema in Bangkok in July 2006.

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Group discussion

Two group discussions were organised.
The first one was dedicated to the national surveillance programme on HPAI. The participants were divided into two groups, with the same list of questions (see annex IV), in order to make them think about the approach adopted so far for AI surveillance in Philippines. They were especially requested to comment on the appropriateness between the objectives of the program and the surveillance protocol.
The second group discussion was the occasion for the BAI to present the content of the newly designed FMD control program. During the discussion participants from the provinces got the opportunity to discuss the implementation in the field of the current program outlining some constraints they were facing.

Some outputs of those discussions are provided in the annex V.

Acquired knowledge

An evaluation measured the knowledge acquired by the participants at the end of the training and gave information on the participants' perception of a problem or a given concept.

A multiple choice questionnaire (See Annex VI) was used at the start of the session to have a baseline of the participants' initial knowledge and perceptions, and then at the end of the training to measure the degree of improvement. Questions were asked in ascending order of difficulty.

The objectives of the evaluation were:

- to measure the basic overall skills of the group
- to detect potential disparities in order to adapt the content of the course
- to measure the overall progress of the entire group

Thus, it was individual and anonymous.

The means of the MCQs are significantly different ($p<0.001$ using a Student t-test) between the two evaluations, with the mean of the final evaluation (13.2/20) representing a progress of more than **5 points** compared to the initial evaluation (7.9/20).

The mean progression is maybe the result of a **better understanding** after the training by the participants. Details of the MCQ are available in the annex VI.

Evaluation of satisfaction

The last day of the workshop, each participant was asked to write his/her remarks about the training proposed and to quantify his/her degree of satisfaction about the contents and the method used (See

training evaluation form in Annex VII). The assessment is on the whole positive. The total satisfaction rate is 87%. The exercises, questions and answer sessions and the group discussions were the most appreciated by the participants. The parts on sampling, Chi-square test and risk analysis were found the most difficult to understand by some participants. Several participants suggested that the course should have been scheduled on a longer period. Some also suggested having more exercises.

Teaching material

The set of teaching materials used by the trainers as well as some additional reading material on epidemiology and the softwares used for calculating the sample size (Winepiscope and FreeCalc) were compiled in a CD-ROM given to each participant at the end of the workshop.

5. Conclusion and recommendations

The main objectives of the training session were achieved:

- To enhance the knowledge of participants in epidemiology
- To exchange experiences on activities in epidemiology developed in the country for HPAI and FMD

The training also gave the opportunity to the national trainer to refresh his mind on the use of RANEMA and to get more experience on the organisation of training for professionals

It has to be noted that after the training in Bangkok in July 2006, RANEMA was distributed nationally to university teachers and to some veterinary officers.
There is no doubt that after this second training, the confidence of the national trainer will be strengthened and that additional trainings will be organised to progressively enhance the level of veterinary officers.

During the workshop a true dynamic of experiences-sharing was born between participants who showed a great interest and an important involvement in every activity proposed. This dynamic could be maintained through the organisation of regular workshops where further epidemiologic concepts could be taught (design of epidemiologic surveys, statistics, data management ...).

Acknowledgements

We thank OIE Tokyo for funding this workshop; Dr Shiro Yoshimura, Dr Ronello Abila and Dr Rustan Patacsil as facilitators; Dr Reildrin Morales and Mrs Tet Gealone from the BAI for arranging all the logistics of the workshop and for their support and warm welcome to the instructors.

Annex I: Educational objectives

At the end of the training, in the field of applied veterinary epidemiology and the control of disease in populations, the participants should be able to:

1. To give the definition of the **main words** used in epidemiology: epidemiology; descriptive epidemiology / analytical epidemiology; epidemic (epizootic) / endemic (enzootic) / pandemic (panzootic) / common source epidemic; incidence / prevalence; morbidity rate / mortality rate / case fatality rate; disease / infection, reservoir, vector.

2. To explain the **difference** between the **descriptive** epidemiology approach and the **analytical** epidemiology approach.

3. To implement the **descriptive epidemiology approach** for any disease in a population: to process and analyse the main measures of disease frequency (incidence, prevalence and the different rates) by using the appropriate unit of epidemiological interest (the individual or the herd) and by quantifying disease occurrence in a population, in time.

4. To give the definition of the **words**: screening test, diagnostic test, sensibility and specificity of a test, predictive values (negative or positive) of a result, apparent prevalence, and true prevalence.

5. To calculate the sensitivity, specificity and predictive values of a **screening test** applied at individual level and to distinguish the quality of a test and the quality of the results.

6. To prepare a simple **sampling design** in order to estimate a prevalence or a rate (**quantitative** approach) to describe a disease in a region and/or during an outbreak (animal health, public health):

    a. To define a representative sample
    b. To make the difference between accuracy and precision
    c. To define the factors influencing the accuracy and the precision of the result estimated from a sample
    d. To calculate the confidence interval of the population prevalence
    e. To calculate the required sample size required depending on the desired level of precision
    f. To compare the a prevalence between two populations (calculation of Chi2 for a given degree of freedom, signification of Chi2, determine and understand the signification of the P-value

7. To prepare a simple **sampling design** in order to detect the presence of a disease (or, its absence) in the study population (**qualitative** approach):
    a. To calculate the required sample size required depending on the selected level of confidence
    b. To analyse the results from a qualitative study

8. To apply the analytic epidemiology approach to a given situation, by using the notions of relative risk, odds ratio, statistical association and causal relationship:
    a. To define the principles of a cohort study and a case-control study, the advantages and disadvantages of each kind of study, to explain the sampling procedure.
    b. To calculate the RR and the OR
    c. To give the signification of the RR and the OR
    d. To explain the difference between a statistical association and a causal relationship

Annex II: Programme

	Monday, January 29th	**Tuesday, January 30th**	**Wednesday, January 31st**	**Thursday, February 1st**	**Friday, February 2nd**
08:30-9:00	Registration	Question time	Question time	Question time	Question time
09:00-09:30	Official opening: OIE, BAI, CIRAD		Ranema Chapter 3.1: Sampling Chapter 3.2: Determining a simple size with quantitative objective	Ranema: Chapter 3.4: Interpreting results – chi 2 test	Ranema-flu: Chapter 4.1: Introduction to risk analysis
09:30-10:15	Introduction + participants presentation	Ranema-flu: Chapter 1.3 : HPAI epidemiology Chapter 2.1 : Case definition for HPAI			
10:15-10:30	MCQ				
10:30-11:00	*Tea break*				
11:00-11:30	OIE presentation	Ranema-flu Chapter 2.2 : Surveillance for domestic poultry	Ranema Chapter 3.3: Determining sample size with qualitative objective	Ranema: Chapter 4.1 (and 2 if time allows): causality	Ranema-flu: Chapter 4.2: Application of RA to AI
11:30-12:10	General introduction to epidemiology				
12:30-14:00	*Lunch*				
14:00-14:40	Surveillance network: design and data standardisation Distribution of material Pedagogic objectives	Working groups: surveillance methods AI Discussion on Philippine AI national plan	Ranema-flu Chapter 2.3: sampling size for AI surveillance + Use of Winepiscope and FreeCalc	Working groups: surveillance methods for FMD	Discussion and explanation on sensitive points of previous
14:40-15:30	Ranema: Chapter 1.2: Disease frequency		Discussion and explanation on sensitive points Problem 3 + solution 3		OIE discussion on future plans
15:30-16:00	*Tea break*				
16:00-16:15	Ranema: Chapter 1.3 : Inc / Prev	Problem 1 + solution 1	Discussion and explanation on sensitive points Problem 3 + solution 3 (cont) + OIE web site presentation	Discussion and explanation on sensitive points lessons problem 4 / solution 4	MCQ
16:15-16:30					Training evaluation
16:30-17:00					Closing ceremony
Evening					

Annex III: List of participants

Region/Office	Participants	Position	Program Activities Involved in
Regional Participants			
CAR	Dr. Jerry D. Sabado	Agriculturist I	AI, FMD and other animal health programs
I	Dr. Annie Q. Bares	Senior Agriculturist	AI and FMD
II	Dr. Susie Clemente	Senior Agriculturist	AI
III	Dr. Elva D. P. Borja	Agricultural Technologist	AI
IVA	Dr. Celo A. Lantican	Quarantine Inspector	AI and FMD
IVB	Dr. Hilda Balag	Agriculturist II	AI and FMD
V	Dr. Rona P. Bernales	Regional Animal Health Officer	AI, rabies and other animal health programs
VI	Dr. Jonic Natividad	OIC, RADDL VI	AI
VII	Dr. Teodoro A. Dabocol	Chief, RADDL VII	Animal Health Program
VIII	Dr. Zaldy H. Villanobos	Agriculturist II	AI
IX	Dr. Marcelina Alcazaren	Veterinarian II	AI, FMD and other animal health programs
X	Dr. Viralou L. Tuquib	Agriculturist I	Animal Health Program
XI	Dr. Mylene Cabigulogan	Veterinarian II	AI, FMD and other animal health programs
XII	Dr. John B. Pascual	Chief, Livestock Division	AI
CARAGA	Dr. Esther B. Cardeno	OIC - RADDL CARAGA	AI
ARMM	Dr. Norodin Kuit	Regional Veterinarian	AI, FMD and other animal health programs
National (BAI)			
BAI - NVQS	Dr. Joy Lourdes Amba	Agriculturist II	AI
BAI - PAHC	Dr. Benjon Barachina	Agriculturist II	AI
BAI - NFMDTF	Dr. Ann Catherine Umandal	Agriculturist II	FMD
BAI - NFMDTF	Dr. Sharie Michelle Aviso	Field Veterinarian	FMD
BAI - NFMDTF	Dr. Angel Singson	Field Veterinarian	FMD
BAI - Public Info	Dr. Ma. Gracia Flores	Senior Agriculturist	AI
BAI- LSD	Dr. Rosemarie Antegro	Supervising Agriculturist	Hog Cholera/ND
BAI - PAHC	Dr. Sylvanna Sison	Senior Agriculturist	Laboratory Disease Diagnosis
BAI - LSD	Dr. Vanessa Ramos	Agriculturist II	AI

Annex IV: Group discussion on HPAI national surveillance program

Summarized national active AI surveillance programme

- 20 Priority Areas
  - High probability of commingling of migratory birds and native poultry population.
  - Back-entry
- Bi-annual (migratory period from October to March)
- 6 barangays per priority area
- 30 samples per barangay
- Serum & cloacal swab
  - Ducks
  - Native chickens, quails, pigeons, game fowls, etc.
  - NO MIGRATORY BIRDS

Questions to be discussed in groups

- According to the presentation on AI active surveillance activities, can you state what the objective of the program is?

- Do you think the protocol meets the objective?

- Can you comment on the assumptions about the expected prevalence chosen to calculate the number of banrangays and the number of samples to collect:
  - Selection of barangays: 10% expected herd prevalence
  - Selection of animals: 20% expected prevalence

- Do you have comment on the passive surveillance network?

  - Is there any case-definition for an HPAI suspect case for domestic poultry?

  - For wild birds?

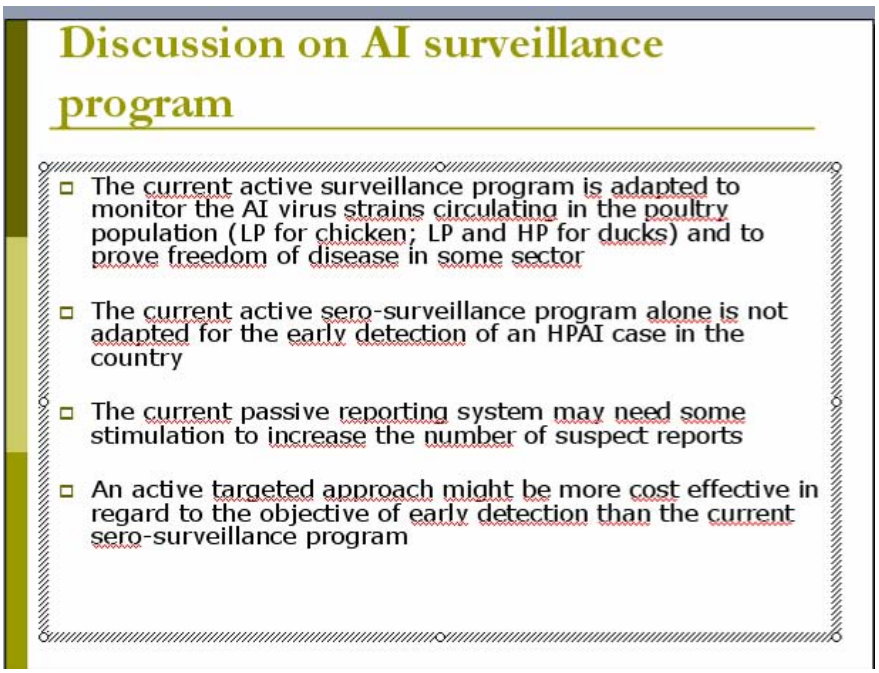
  - What was the way chosen to inform the stakeholders on the need to report an HPAI suspect case? (the approach was identical all over the country or different according to the region?)

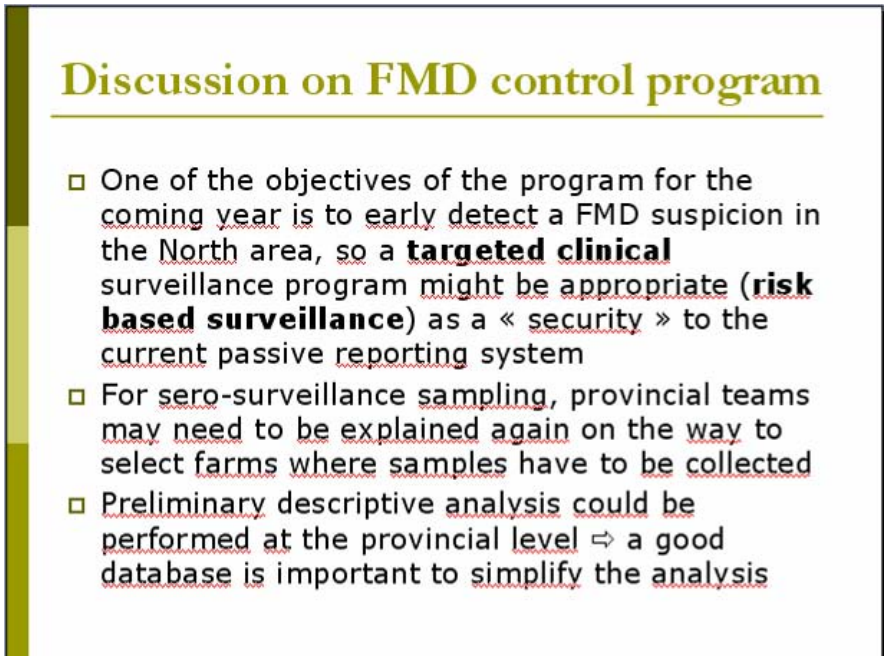
  - Did you have many HPAI suspicions reports last year?

  - What is the information flow from the field to the national level?

  - What are the means for information feedback to the stakeholders

Annex V: Main outputs of the group discussions





Annex VI: MCQ

10-15 min.

***Epidemiology* is based on that key issue:**

- Diseases are studied at individual level ☐
- Diseases are not randomly distributed ☐
- Diseases are randomly distributed ☐

Analytical studies are used to:

- To study distribution ☐
- To study determinants ☐
- To implement control programs ☐

Definition of prevalence and incidence:

Prevalence:

Incidence:

Definition of proportion, ratio and rate:

Proportion:

Ratio:

Rate:

When conducting a prevalence study, how can you get an accurate result?

When conducting a prevalence study, how can you get a precise result?

When calculating the sample size needed to study the prevalence of a disease, if you have no idea of the situation of that disease, you need:

- to take an expected prevalence close to 100% ☐
- to take an expected prevalence of 50% ☐
- to take an expected prevalence close to 0% ☐

When doing statistical test, the p value reprensents:

- the value of the test ☐
- the level of significance ☐
- the type I error ☐

Sensitivity of a diagnostic test is the proportion:

- of truly non-diseased animals ☐
- of truly diseased animals ☐
- of apparently diseased animals ☐

In a disease free area, you suspect ASF, what kind of test are you choosing:

- High specificity and high sensitivity ☐
- Low specificity and low sensitivity ☐
- High specificity and low sensitivity ☐
- Low specificity and high sensitivity ☐

Targeted surveillance means that:

- Surveillance is implemented at random on the population ☐
- Surveillance is implemented using passive reporting on the disease ☐
- Surveillance is implemented on selected localities or species, based on the increased likelihood of infection ☐

The advantage of stratified random sampling versus simple random sampling to estimate the prevalence of a disease in a country of 5 provinces:

_____

_____

_____

_____

_____

If incidence is low, but duration is long (chronic):

- Prevalence will be large in relation to incidence ☐
- Prevalence will be low in relation to incidence ☐
- Prevalence doesn't vary directly with incidence or occurrence ☐

The *95% confidence interval* for the mean (2 correct answers):

- Contains the sample mean with 95% certainty ☐
- Is less likely to contain the population mean than the 99% confidence interval ☐
- Give an indication if the sample mean is a precise estimate of the population mean. ☐
- Increases as the size of the sample from a given population increases ☐

Annex VII: Training evaluation

Evaluation of Training

Please, cross the answer the most appropriate in your opinion
How do you consider the workshop:
Satisfaction rating: very good (100%), good (75%), average (50%), bad (25%), very bad (0%)

Global course over five days Satisfaction rating: 87%

Day 1 Satisfaction rating: 91%

Presentation: OIE Satisfaction rating: 91%

very good	good	average	bad	very bad

Presentation: Introduction to epidemiology Satisfaction rating: 92%

very good	good	average	bad	very bad

Presentation: Surveillance network Satisfaction rating: 89%

very good	good	average	bad	very bad

Ranema: Measures of disease frequency (Chapter 1.2) Satisfaction rating: 90%

very good	good	average	bad	very bad

Ranema: Prevalence/incidence (Chapter 1.3) Satisfaction rating: 92%

very good	good	average	bad	very bad

Day 2 Satisfaction rating: 88%

Ranema flu: HPAI epidemiology (Chapter 1.3) Satisfaction rating: 89%

very good	good	average	bad	very bad

Ranema flu: HPAI case definition (Chapter 2.1) Satisfaction rating: 89%

very good	good	average	bad	very bad

Ranema flu: HPAI surveillance (Chapter 2.2) Satisfaction rating : 88%

very good	good	average	bad	very bad

Working group on AI surveillance Satisfaction rating: 85%

very good	good	average	bad	very bad

Day 3 Satisfaction rating: 86%

Ranema: Sampling (Chapter 3.1) Satisfaction rating: 87%

very good	good	average	bad	very bad

Ranema: Determining a simple size with quantitative objective (Chapter 3.2) Satisfaction rating: 85%

very good	good	average	bad	very bad

Ranema: Determining sample size with qualitative objective (Chapter 3.3) Satisfaction rating: 86%

very good	good	average	bad	very bad

Ranema flu: Sampling size for AI surveillance (Chapter 2.3) Satisfaction rating: 83%

very good	good	average	bad	very bad

Presentation: WAHIS system of the OIE Satisfaction rating: 88%

very good	good	average	bad	very bad

Day 4 Satisfaction rating: 83%

Ranema: Interpreting results – chi 2 test (Chapter 3.4) Satisfaction rating: 89%

very good	good	average	bad	very bad

Ranema: Causality (Chapter 4.1) Satisfaction rating: 90%

very good	good	average	bad	very bad

Working group on FMD surveillance Satisfaction rating: 78%

very good	good	average	bad	very bad

Day 5 Satisfaction rating: 84%

Ranema flu: Introduction to risk analysis (Chapter 4.1) Satisfaction rating: 82%

very good	good	average	bad	very bad

Ranema flu: Application of RA to AI (Chapter 4.2) Satisfaction rating: 80%

very good	good	average	bad	very bad

Discussion and explanation on previous points Satisfaction rating: 91%

very good	good	average	bad	very bad

What did you like most in the training course?

Is there something you did not like at all?

What was the most difficult to understand during this training ?

What are your suggestions to improve upcoming training?

Annex VIII: Pictures